REMARKS

This paper is being provided in response to the Office Action mailed June 4, 2003, for the above-referenced application. In this response, Applicants have rewritten claims 3, 4, 12 and 14 in independent form, amended claim 1 and added new claim 15 to clarify that which Applicants consider to be the invention. Further, Applicants have amended the specification and drawings for purposes of clarification. Applicants respectfully submit that the amendments to the claims are fully supported by the originally-filed specification and that the amendments to the specification and drawings do not add new subject matter.

The objection to the disclosure has been addressed by amendments to the specification contained herein that are provided according to the guidelines set forth in the Office Action. Applicants have amended the specification to reference the appropriate figures; however, in some instances, instead of specific references to figures following each reference numeral, Applicants have generally referred to the cited figures where appropriate for purposes of clarity and readability. Accordingly, Applicants respectfully request that this objection be reconsidered and withdrawn.

The objection to the drawings has been addressed by the amendments to figures and specification contained herein according to the guidelines set forth in the Office Action. Applicants submit herewith revised Figs. 2, 4, 5, 7, 10, 11, and 12 in which the scripted "l" has been corrected to the symbol λ. Accordingly, Applicants respectfully request that this objection be reconsidered and withdrawn.

Applicants thank the Examiner for indication of allowable subject matter in claims 3-7, 12 and 14. Applicants have rewritten claims 3, 4, 12 and 14 in independent form including all of the limitations of the base claim and any intervening claims according to the guidelines set forth in the Office Action. Claims 5-7 depend on independent claim 4, as amended herein.

The objection to the claims has been addressed by amendments contained herein according to the guidelines set forth in the Office Action. Accordingly, Applicants respectfully request that this objection be reconsidered and withdrawn.

The rejection of claim 8 under 35 U.S.C. 112, second paragraph, as being indefinite is hereby traversed and reconsideration is respectfully requested. Applicant's claim 8 recites that the metal members have ends on a signal conductor side that are aligned with ends of the second via holes on the signal conductor side. This embodiment is described on page 7, lines 7-17 and in Figure 3. Accordingly, Applicants respectfully request that this rejection be reconsidered and withdrawn.

The rejection of claims 1, 2, 8-11 and 13 under 35 U.S.C. 103(a) as being unpatentable over the Applicants' admitted prior art (hereinafter "Applicants' APA") in view of Japanese Patent No. 5-75313 (hereinafter "the '313 reference") is hereby traversed and reconsideration is respectfully requested.

Independent claim 1, as amended herein, recites an RF package including a multilayered dielectric substrate on which first and second dielectric substrates are formed. The multilayered

dielectric substrate has a cavity in the second dielectric substrate where a semiconductor element is to be mounted on the first dielectric substrate. A feed-through exists for connecting an inside and outside of the cavity and is comprised of a coplanar line formed on the first dielectric substrate and an inner layer line formed on the first dielectric substrate obtained by forming the second dielectric substrate on the coplanar line. The coplanar line and the inner layer line share a signal conductor formed on the first dielectric substrate. Metal members are formed at a connection interface between the coplanar line and the inner layer line on two sides of the signal conductor, and connect first ground conductors of the coplanar line and the inner layer line on the first dielectric substrate to a second ground conductor disposed on a top surface of the second dielectric substrate at an edge of the second dielectric and at an interior portion of the first dielectric substrate. A plurality of first via holes is formed in the first dielectric substrate and a plurality of second via holes is formed in the second dielectric substrate. Further, the coplanar line has a discontinuous surface caused by a level difference of the first and second dielectric substrates on the outside of said cavity, said discontinuous surface being the connection interface between said coplanar line and said inner layer line. Claims 2, 8-11, and 13 depend from independent claim 1.

Applicants' APA discloses an RF package having two ceramic layers with a cavity that penetrates the top layer. A feed through is divided into a coplanar line and inner layer line and is comprised of a signal conductor and ground conductors on first and second substrates.

The '313 reference is indicated by the Office Action as disclosing an integrated circuit package using microwave strip lines (or microstrip lines). The Office Action further notes that

the upper substrate of the package comprises an upper ground plane and that the ground lines are electrically connected by via connections to the upper ground plane at locations which are spaced along the edge of the upper substrate including vias at the edge of the upper dielectric substrate.

Applicants' independent claim 1 recites as least the feature of metal members *disposed at a connection interface between the coplanar line and the inner layer on two sides of the signal conductor* and connecting first ground conductors...on the first dielectric substrate to a second ground conductor disposed on a top surface of the second dielectric substrate *at an edge of the second dielectric and at an interior portion of the first dielectric substrate.* This configuration results in the coplanar line having a discontinuous surface caused by a level difference of the first and second dielectric substrates, the discontinuous surface being the connection interface between the coplanar line and the inner layer line. Applicants have found that a plurality of metal members as interface electrodes, when arranged on two sides of the signal conductor between the coplanar line and the inner layer line is more effective in suppressing an electromagnetic field that extends from the outside of the interface electrodes. (See page 7, line 17 to page 8, line 2). The metal members connect ground conductors at an edge of the second dielectric and at an interior portion of the first dielectric substrate because the second layer substrate is smaller than the first layer substrate. (See page 5, lines 14- 18). The result is a high frequency package having a feed-through constitution which can be manufactured easily without deteriorating a transmission characteristic in high frequency.

Applicants respectfully submit that neither Applicants' APA nor the '313 reference teach or fairly suggest at least these features as claimed by Applicants. The Office Action cites

Applicant's APA (Figure 8) and the '313 as suggesting via connections connecting coplanar ground planes to the upper ground plane on the second substrate along the edge of the upper substrate. Applicants' APA does not disclose any metal members connecting ground conductors positioned on the dielectric substrates. The via connections (10c) disclosed by '313 reference connect microstrip lines to ground planes along the *edges of both the substrates and the ground planes*, and not to an interior, non-edge portion of any substrate or ground plane.

Further, the present invention aims at the restraint of the signal emission by the discontinuous surface, caused by the level difference between the first dielectric layer and the second dielectric layer, of the coplanar line on the outside of the cavity. Applicants' claim 1 recites that *the coplanar line has a discontinuous surface caused by a level difference of the first and second dielectric substrates on the outside of said cavity, said discontinuous surface being the connection interface between said coplanar line and said inner layer line.* In contrast, the '313 reference arguably does not have a discontinuous surface on the outside of the cavity. This is illustrated in Figure 2 of the '313 reference in which the outer wall of the laminated dielectric layers 2 and 3 are shown as a perpendicular surface.

Applicants respectfully submit that the prior art of record does not disclose metal members *disposed at a connection interface between the coplanar line and the inner layer on two sides of the signal conductor* and connecting first ground conductors...on the first dielectric substrate to a second ground conductor disposed on a top surface of the second dielectric substrate *at an edge of the second dielectric and at an interior portion of the first dielectric substrate*, as is claimed by Applicants. Further, nothing in the prior art of record teaches or fairly

suggests that *the coplanar line has a discontinuous surface caused by a level difference of the first and second dielectric substrates on the outside of said cavity, said discontinuous surface being the connection interface between said coplanar line and said inner layer line*, as claimed by Applicants.

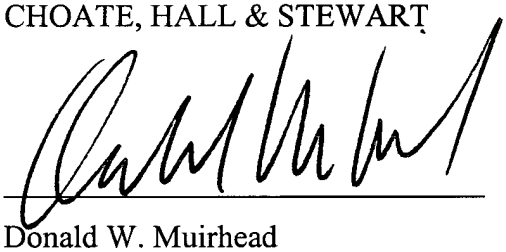
Accordingly, in view of the above, Applicants respectfully request that the rejection be reconsidered and withdrawn.

Furthermore, Applicants respectfully submit that one of ordinary skill in the art would not combine the '313 reference with Applicants' APA to produce the claimed invention. First, the '313 reference discloses a microstrip line while Applicants' disclose and recite a coplanar line and Applicant's note that the function of these lines are different. Further, even if the '313 reference could be combined with Applicants' APA, Applicant respectfully submits that the via holes 10a-10c disclosed in the '313 reference are formed for a different purpose than the metal members recited by Applicants. The via holes disclose in the '313 reference are formed on the outer wall of the dielectric layer which does not have a discontinuous surface of a microstrip line. The via holes do not exist at all on the inner wall of the dielectric layer. These via holes act as a shield to high frequency, as indicated in paragraphs 0021-0022 (translation included in the attached Appendix). In contrast, the metal members of the present invention act in such a way that the signal emission in the interface portion of a coplanar line may be restrained. Applicants' respectfully submit that one of ordinary skill in the art would not combine the via holes of the '313 reference acting as a shield to high frequency with an RF package as described in the present specification.

Applicants have added new claim 15 and respectfully submit that this is claim is also allowable over the prior art of record.

Based on the above, Applicant respectfully requests that the Examiner reconsider and withdraw all outstanding rejections and objections. Favorable consideration and allowance are earnestly solicited. Should there be any questions after reviewing this paper, the Examiner is invited to contact the undersigned at 617-248-4038.

Respectfully submitted,
CHOATE, HALL & STEWART



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APPENDIX

Translation of paragraphs [0021] and [0022] of the '313 reference:

[0021] Fig. 2 is a perspective view showing other examples of the present invention, and the ground layer is formed by interconnecting the 3rd metallizing layers 5a and 5b provided as a ground layer with the 1st and 2nd metallizing layers 6 and 4 by via holes 10a, 10b, 10c provided in the predetermined portions of the 1st and 2nd dielectric substrates 2 and 3.

[0022] As thus described, by connecting the metallizing layers appropriately by via holes, it becomes possible to make up for the weak point that the shield effect over high frequency was not enough, when the area of a dielectric substrate is large.